



# International Space Station Environment Control and Life Support System Book

## ISS-Expedition 1

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**Mission Operations Directorate  
Operations Division**

**Preliminary  
March 11, 1998**

*These procedures are available  
electronically on the SODF Homepage  
at <http://ftpproc.jsc.nasa.gov>*

National Aeronautics and  
Space Administration

Lyndon B. Johnson Space Center  
Houston, Texas



**INTERNATIONAL SPACE STATION  
ENVIRONMENT CONTROL AND  
LIFE SUPPORT SYSTEM BOOK  
ISS-EXPEDITION 1**

PRELIMINARY  
March 11, 1998

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This document is not currently under the configuration control of the Systems Operations Data File Control Board (SODFCB). During the interim, changes may be submitted to the book manager.

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The SODF procedures listed here are for the use of the Expedition 1 crew. By final publication, all applicable Increment 1 procedures will be included in this list. The current list of procedures is for use from 2R docking to 5A docking based on Rev C Assembly Sequence.

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NOMINAL PROCEDURES

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**NOMINAL**

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## NODE 1 CABIN FAN ACTIVATION R2

### 1. VERIFY RPCM STATUS

EPCS sel [X] values [X] =   ...

Node 1: EPS: RPCM N14B [X]

√RPC [X] Position - Open

Repeat

### 2. SMOKE DETECTOR SD 2 ACTIVATION

EPCS Node 1: ECLSS: SD2

### 3. sel RPCM N13B A RPC 16

√Close Cmd - Ena

√**MCC-H**

**cmd Close Execute**

√Position - CI

#### NOTE

If using time tagged commands, allow a minimum 2 second delay between the close RPC command and the monitor enable command to allow the smoke detector voltages to stabilize.

### 4. **cmd Monitor Status - Enable Execute**

√Active BIT Inprog - True

Wait at least 3 seconds, then

√Active BIT Inprog - False

√Active BIT Fail - Operational

√Obscuration, % Contam ~0

√Scatter, % obs/m ~0

√Monitor Status - Mon

EPCS Node 1: ECLSS: FDIR

5. **cmd** Node 1-1 MDM Fire Isolation Status - Enable **Execute**  
√Node 1-1 MDM Fire Isolation Status - Ena
6. **cmd** Node 1-2 MDM Fire Isolation Status - Enable **Execute**  
√Node 1-2 MDM Fire Isolation Status - Ena

EPCS

7. ACTIVATE NODE 1 CABIN FAN

8. Node 1: ECLSS: cab fan

sel RPCM N14B B RPC 17

√Close Cmd - Ena

√**MCC-H**

**cmd** Close **Execute**

√Position - Cl

9. **cmd** On **Execute**  
√State - On  
√Limit Status - Ena  
√Speed, rpm: TBD --- TBD  
√dP, mmHg: TBD --- TBD

NOTE

The Cabin Fan speed must be set to a lower speed for Node air scrubbing.

10. If fan activation is for Node air scrubbing

**cmd** 3400 rpm **Execute**

Wait 10 seconds, then

√Speed, rpm: 2956 --- 3844 rpm

11. SMOKE DETECTOR SD 1 ACTIVATION

EPCS

12. Node 1: ECLSS: SD1

sel RPCM N14B C RPC 03

√Close Cmd - Ena

√**MCC-H**

**cmd Close Execute**

√Position - CI

NOTE

If using time tagged commands, allow a minimum 2 second delay between the close RPC command and the monitor enable command to allow the smoke detector voltages to stabilize.

Node 1 Smoke Detector 1

13. **cmd Monitor Status - Enable Execute**

√Active BIT Inprog - True

Wait at least 3 seconds, then

√Active BIT Inprog - False

√Active BIT Fail - Operational

√Obscuration, % Contam ~0

√Scatter, % obs/m ~0

√Monitor Status - Mon

## NODE 1 CABIN FAN DEACTIVATION R2

- EPCS 1. DEACTIVATE NODE 1 CABIN FAN  
Node 1: ECLSS: cab fan  
 Node 1 Cabin Fan

**cmd Off Execute**  
√Req Ind - Requested  
**cmd Off Confirm Execute**  
√State - Off  
√Limit Status - Inh  
√Speed, rpm - Decreasing

sel RPCM N14B B RPC 17

RPCM N14B B RPC 17

√Open Cmd - Ena

√**MCC-H**

**cmd Open Execute**  
√Position - Op

2. SMOKE DETECTOR 1,2 DEACTIVATION  
Node 1: ECLSS: SD1  
 Node 1 Smoke Detector 1

**cmd Monitor Status - Inhibit Execute**  
√Monitor Status - Not Mon

sel RPCM N14B C RPC 03

RPCM N14B C RPC 03

√Open Cmd - Ena

√**MCC-H**

**cmd Open Execute**  
√Position - Op

Node 1: ECLSS: SD2  
 Node 1 Smoke Detector 2

**cmd Monitor Status - Inhibit Execute**  
√Monitor Status - Not Mon

sel RPCM N13B A RPC 16

RPCM N13B A RPC 16

√Open Cmd - Ena

√**MCC-H**

**cmd** Open **Execute**

√Position - Op

## PORTABLE BREATHING APPARATUS INSPECTION

### PBA INSPECTION

1. Verify that there is no obstruction to access or visibility.
2. Verify that all components are located in designated areas.
3. Verify that the Flex Hose is attached to the Bottle.
4. Verify that seals and tamper indicators are not broken or missing on Cylinder.
5. Verify that there is no obvious physical damage, corrosion, or leakage of Cylinder.
6. Verify PBA Bottle is in operable range.  
√PBA Bottle Press  $\geq$  3000 psig
7. Verify quick access to the PBA HARN INFL VLV.
8. Verify that the Silicone Face Piece, Pressure Harness, Hose, and Visor are free of obvious physical damage or structural defects.
9. Verify that the Microphone Module, Microphone, Communication Cable, and Earphone Cable Assembly are secure and free of damage.
10. Check for obvious physical damage to PBA DMD REG.
11. Check that the PBA DMD REG is in normal mode.
12. Initial and date the inspection card.

## PORTABLE FIRE EXTINGUISHER INSPECTION

### PFE INSPECTION

1. Verify that there is no obstruction to access or visibility.
2. Verify that the Bottle and both Nozzles are located in designated locker.
3. Verify that operating instructions on nameplate are legible and facing outward.

#### NOTE

Inspector may remove Bottle from locker for steps 4 and 5. After step 5, replace the Bottle so that access and visibility is not obstructed.

4. Verify that seals and tamper indicators are not broken or missing.
5. Verify there is no obvious physical damage, corrosion, audible leakage, or clogged nozzles.
6. Verify the PFE Bottle Press  $\geq$  850 psi.
7. Initial and date inspection card.

## SMOKE DETECTOR TEST

PCS      MODULE: HOMEPAGE: FIRE DISPLAY

sel '[Module] Smoke Detector [X]'

'Active BIT In Prog'

1. **cmd Active BIT Execute**

√Active BIT In Prog - True

Wait 3 seconds.

2. √Active BIT In Prog - False

√Fail - Ops

MALFUNCTION PROCEDURES

ISS LEAK ISOLATION.....	TBD
NODE 1 CABIN FAN FAILURE.....	2-3
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NODE 1 IMV VALVE FAILURE.....	2-5
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SMOKE DETECTOR MALFUNCTION.....	2-8

**MALFUNCTION**

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# ECLSS

# NODE 1 CABIN FAN FAILURE

BACKUP C/W ALARM

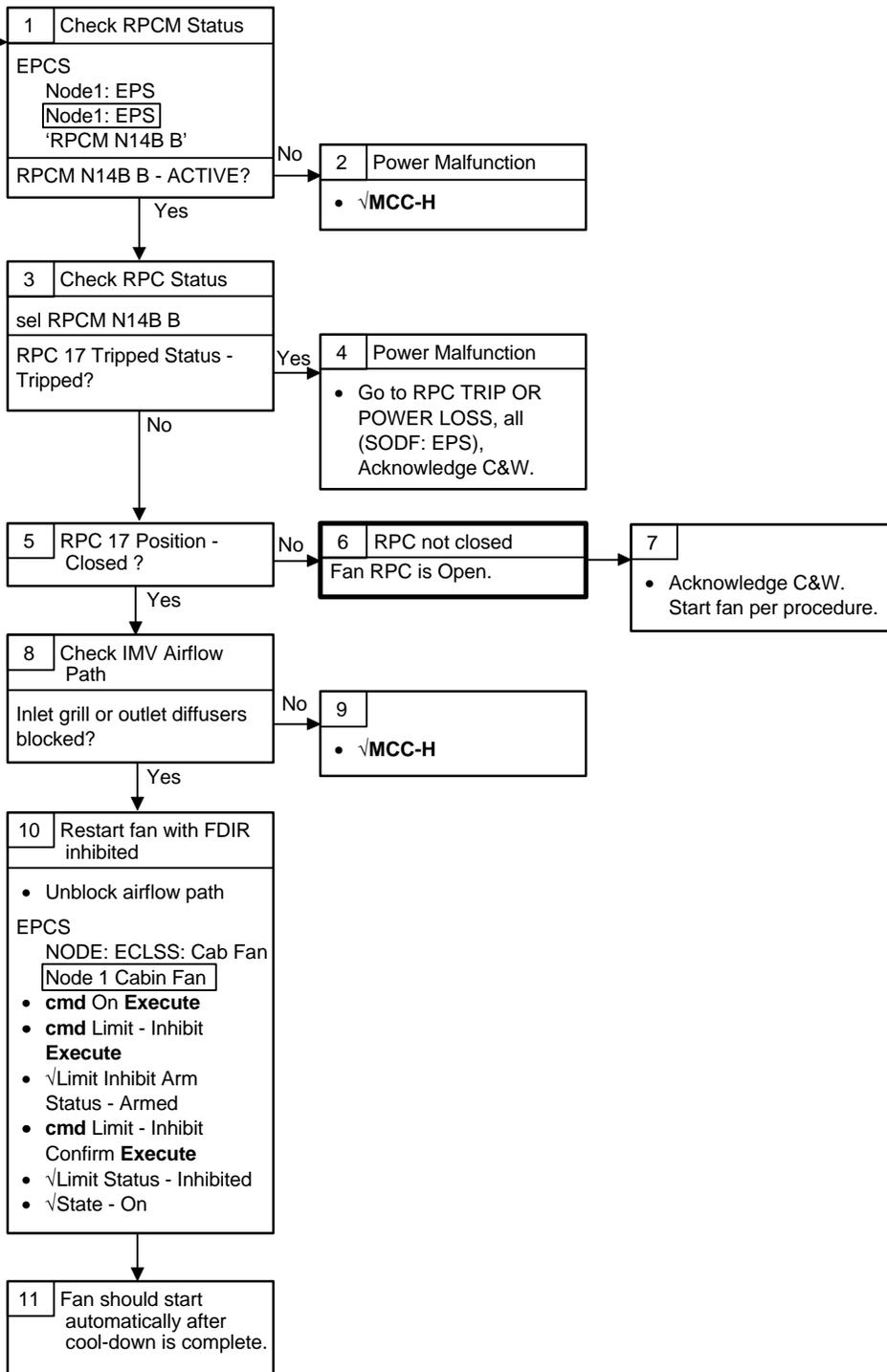
(F7)

S210 ISS C&W CAUT

EPCS  
C&W Sum  
C/W Summary  
Cabin Fan Fail - Node 1

If Cabin Fan speed:  
< 3200 rpm or  
> 7000 rpm

**Nominal Config:**  
Refer to TBD



# ECLSS

# NODE 1 IMV AFT PORT FAN FAIL LOW

BACKUP C/W ALARM

(F7)

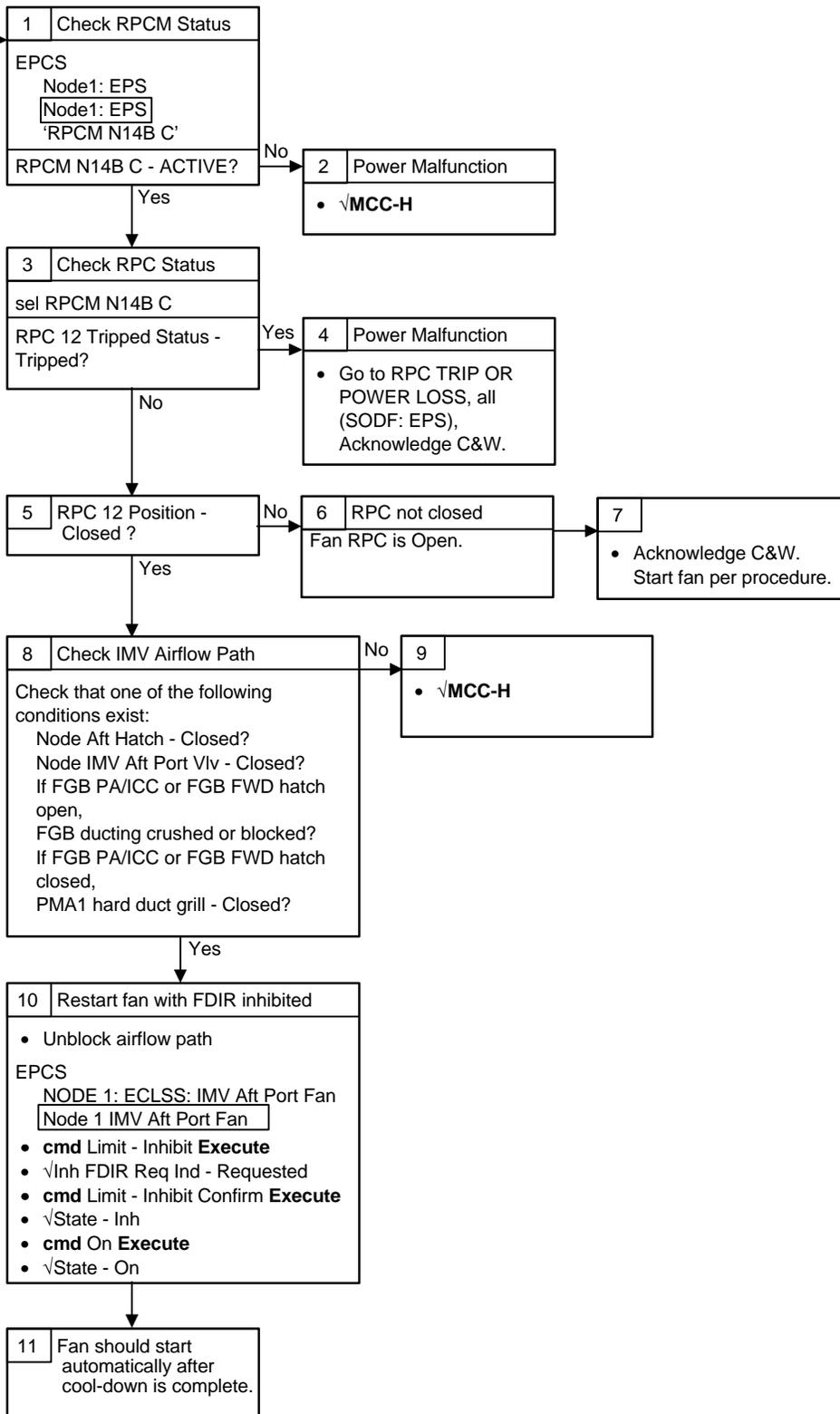
S210 ISS C&W CAUT

EPCS  
C&W Sum  
C/W Summary

IMV Aft Port Fan Fail Low - NOD1

If Cabin Fan speed: < 7462 rpm

**Nominal Config:**  
Refer to TBD



# ECLSS

# NODE 1 IMV VALVE FAILURE

BACKUP C/W ALARM

(F7)

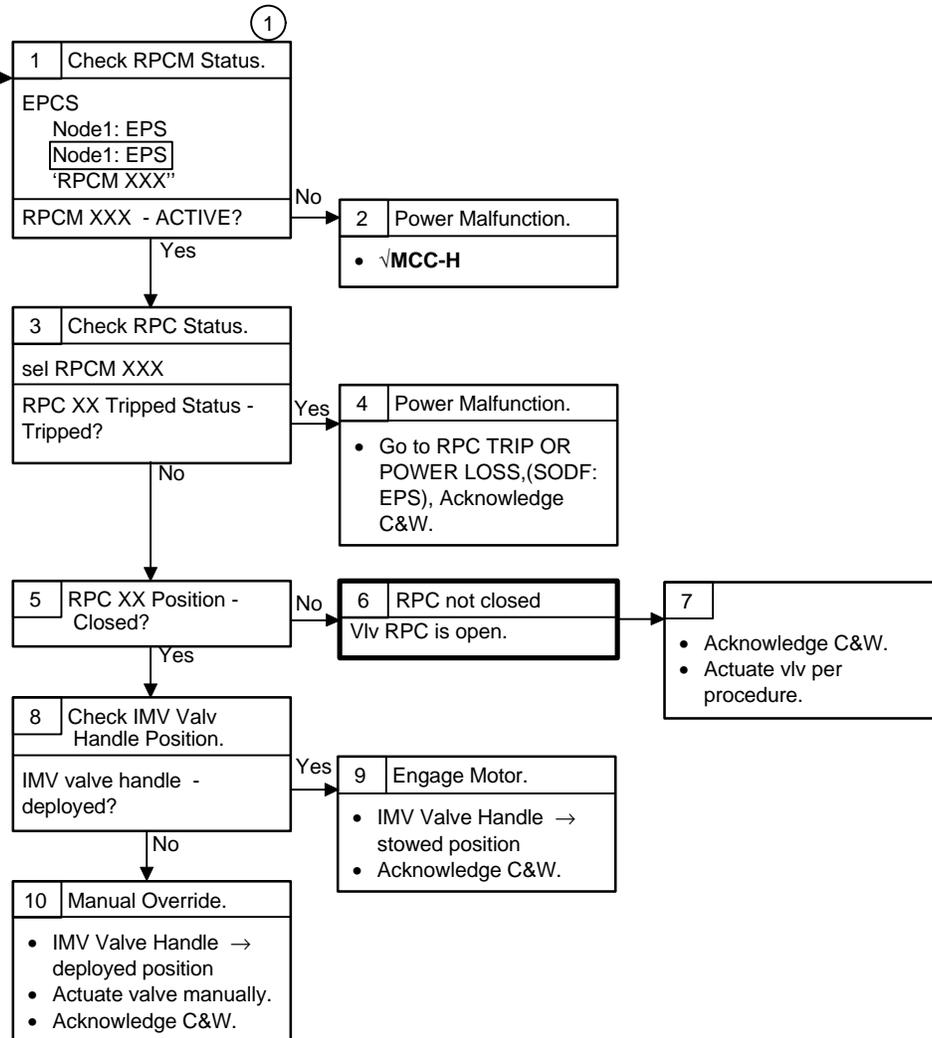
S210 ISS C&W CAUT

EPCS  
C&W Sum  
C/W Summary  
IMV X X Vlv Fail

If IMV fan speed:  
> 9500 rpm

If IMV fan speed:  
< 13.9 or > 15.0

**Nominal Config:**  
Refer to TBD



①  
Equalization of Node 1 with orbiter should be considered to preclude PPRV actuation.  
Node 1 PPRVs crack at 765.2 mmHg (14.8 psid) with full open at 780.7 mmHg (15.1 psid).

# ECLSS

# NODE 1 PRESS HIGH/LOW

BACKUP C/W ALARM

(F7)

S210 ISS C&W WARN

S210 NODE 1 CAB PRES

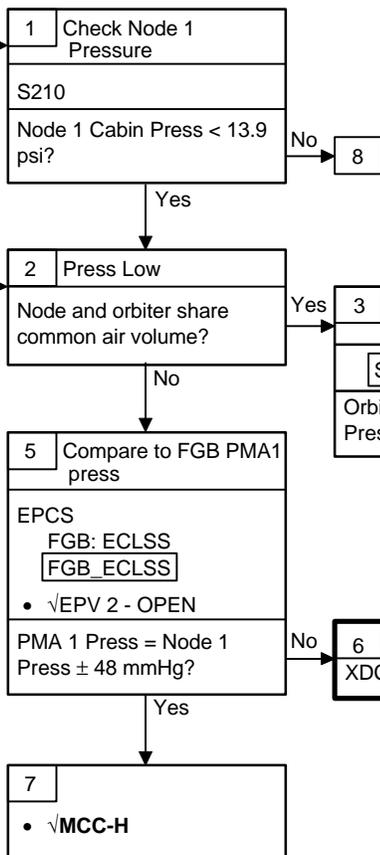
If Node 1 Press:  
< 13.9 or > 15.0 psia

EPCS  
C&W Sum  
C/W Summary

Cabin Press  
Low - Node 1

If N1 Press:  
< 718 mmHg  
(13.9 psia)

**Nominal Config:**  
Refer to TBD



7

- Go to ISS-SS joint leak isolation procedure: O2/N2 FLOW HIGH/CAB P LOW / dP/dT

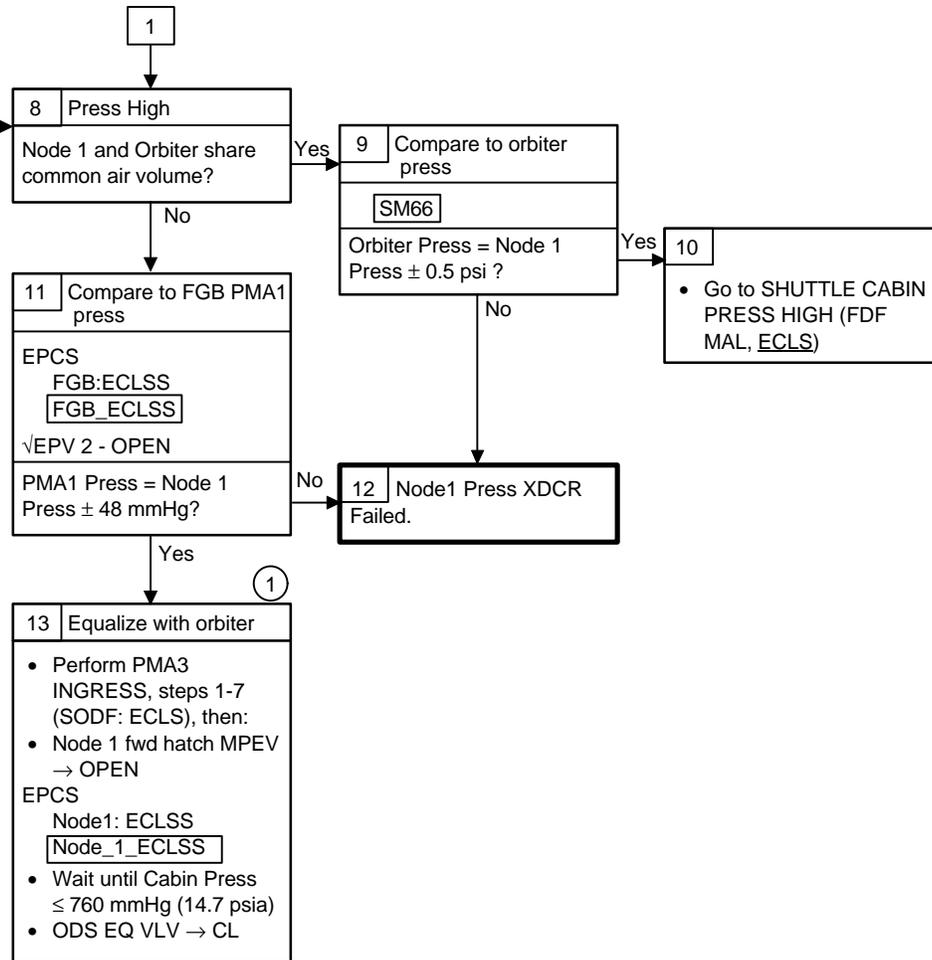
**ECLSS**

**NODE 1 PRESS HIGH/LOW (Cont)**

EPCS  
C&W Sum  
C/W Summary  
  
Cabin Press  
Low - Node 1

If Node 1 press:  
< 786 mmHg  
(15.2 psia)

If Node 1 press:  
< 13.9 or > 15.0



①  
Equalization of Node 1 with orbiter should be considered to preclude PPRV actuation.

Node 1 PPRVs crack at 765.2 mmHg (14.8 psid) with full open at 780.7 mmHg (15.1 psid).

**ECLSS**

**SMOKE DETECTOR MALFUNCTION**

①  
Action causes cautions to reset and triggers an Active BIT.

Class III Caution

Smoke Detector 1(2) Active BIT Fail - NOD1  
Smoke Detector 1(2) Lens Contamination - NOD1  
Smoke Detector 1(2) Fail - NOD1

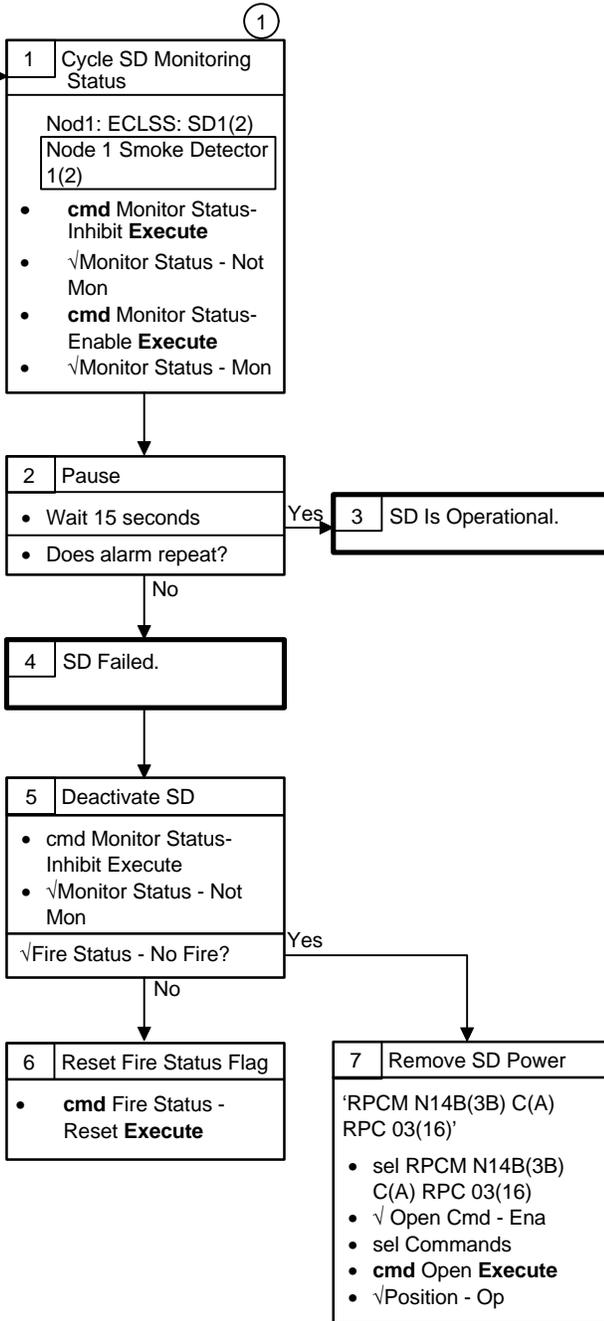
(EPCS)

SM ALERT

S210 ISS C&W CAUT

**Nominal Config:**

Nod1 SD 1(2)  
Act BIT Failed - Operational  
  
Nod1 SD 1(2)  
Lens Contam - Clean  
  
Nod1 SD 1(2) Fire Stat - No Fire  
  
SCTR ≈ 0.0% obs/m  
OBS ≈ 0.0% contam  
  
RPCM N14B(3B)  
C(A) RCP 03(16)  
Position - CI  
  
RPCM N14B(3B)  
C(A) RCP 03(16)  
Trip Stat - False



REFERENCE

FLIGHT 2A, 3A, 4A FGB/PMA 1/NODE 1/PMA 2,3/SHUTTLE ..... TBD

REFERENCE

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CAUTION MESSAGES

ECLSS CAUTION MESSAGE TABLE ..... 4-3

**CAUTION  
MESSAGES**

**CAUTION  
MESSAGES**

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### ECLSS CAUTION MESSAGE TABLE

Message Text	Condition	Action
CABIN FAN FAIL - NODE 1	TBD	TBD
IMV DECK(PORT/STBD) FWD(AFT) VLV FAIL - NODE 1	TBD	TBD
IMV PORT(STBD) FWD(AFT) FAN FAIL HI - NODE 1	TBD	TBD
IMV PORT(STBD) FWD(AFT) FAN FAIL LOW - NODE 1	TBD	TBD
RAMV FAIL - NODE 1	TBD	TBD
SMOKE DETECTOR 1(2) ACTIVE BIT FAIL - NODE 1	TBD	TBD
SMOKE DETECTOR 1(2) FAIL - NODE 1	TBD	TBD
SMOKE DETECTOR 1(2) LENS CONTAMINATION - NODE 1	TBD	TBD
SMOKE DETECTOR FAILURE – FGB	TBD	TBD

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